REMARKS

In the Office Action dated September 8, 2004, pending Claims 1-27 were rejected and the rejection made final. In response Applicants have filed herewith a Request for Continued Examination and have amended independent Claims 1, 14, and 27. These amendments are not in acquiesce of the Office's position on allowability of the claims, but are made merely to expedite prosecution; no change in the scope of the claims is intended by Applicants.

Applicants and the undersigned are most grateful for the time and effort accorded the instant application by the Examiner. On November 18, 2004, Applicants' counsel and one of the inventors, Jiri Navratil, conducted a telephone interview with the Examiner in which the present application, the Goldenthal et al. reference, and the Newman et al. reference were discussed. No agreement, however, was reached with respect to the claims of the present application.

The Office is respectfully requested to reconsider the rejections presented in the outstanding Office Action in light of the following remarks.

The disclosure continues to be objected to because of a number of asserted informalities. Equation 1 on Page 8 has been amended to correct a minor typographical error. Thus, it is submitted this objection should be withdrawn.

The specification also continues to be objected to as failing to provide proper antecedent basis for the claimed subject matter, specifically the term of "non-interpolated

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likelihood value" appearing in Claims 1, 14 and 27. Applicants respectfully submit this objection is improper and should be withdrawn as – contrary to the assertion by the Office – this term is in fact understood by one of ordinary skill in art. A Non-Interpolated Likelihood Value is defined as the complement/opposite to an Interpolated Likelihood Value, which in turn is obtained in the present application from the likelihood function (of the hierarchical speaker model) as a weighted sum of individual values calculated on the various levels and in various units of the hierarchical model. An example of a non-interpolated likelihood value is the (single) maximum likelihood value which can be determined by calculating likelihoods on all levels and units of the hierarchical model and taking the maximum value.

In order to expedite prosecution, however, the claims have been amended to recite "likelihood value" rather than "non-interpolated likelihood value". Support for the term "likelihood value" may be found throughout the specification. (See e.g., Page 12, lines 12-15; "Using the complete unit ensemble provided by the model, a scoring method then assigns the best matching likelihood to each feature vector frame and thus maximizes the resulting model score." and Page 9, lines 10-14; "In a "pickmax" technique in accordance with an embodiment of the present invention (step 209), the likelihood score S for each of the structured models mentioned above is calculated as the average of the likelihoods of the T feature vectors which, in turn, are obtained as the maximum likelihoods computed over all units and all levels of the given speaker's structured model ("pickmax").") Accordingly, Applicants respectfully submit this objection has been obviated.

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Claims 1-3, 6-12, 14-16, 19-25 and 27 stand rejected under 35 USC 103(a) over Goldenthal et al. in view of Newman et al. Reconsideration and withdrawal of the present rejection is hereby respectfully requested.

The present invention broadly contemplates, in accordance with at least one presently preferred embodiment, the calculation of scores in such a way that the total likelihood is a weighted sum of the likelihood of all phonetic units at all levels of phonetic granularity (model grains), and that the weights are derived in such a way that the determination of the robustness and significance of the individual model grains is approached with emphasis. (Page 2, line 16 - Page 3, line 4) Given a structured model $M(i,j)$ for a speaker with $1 \leq i \leq L$ levels of detail and with $1 \leq j \leq K(i)$ units on the i-th level, the score (as log-probability) for the utterance is calculated in each level separately, whereby explicit labeling information is used to identify the corresponding phonetic unit that is to be used on each level. (Page 8, lines 5-8) As discussed in the specification, the number of units on each level and the number of levels may vary across speakers, since there might be less data available from certain speakers, entailing the necessity of omitting certain units altogether. (Page 10, lines 7-9)

As presently best understood, Goldenthal appears to be directed to a two-stage cohort selection technique used to reduce the equal error rate of a speaker verification process which validates the claimed identity of an unknown speaker. (Col. 2, lines 61-65) First a the digitized signals of an unknown speaker seeking verification are compared with acoustic models corresponding to the claimed identification to determine "claimed" log likelihood scores. (Col. 5, lines 18-22) Then the same testing signals are compared

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with all of the cohort models to determine cohort log likelihood scores and then a smaller subset of cohort scores is dynamically selected. (Col. 5, lines 23-30) The claimed scores and the dynamically selected scores are then presented to a validator which determines whether or not a threshold difference between the two scores is present. (Col. 5, lines 31-46) There is, however, no teaching or suggestion that the models used in calculating the various log likelihood scores have multiple levels of detail or that scores are calculated for each level of detail.

As presently best understood, Newman appears to be directed producing a speech model for use in determining whether a speaker associated with the speech model produced an unidentified speech sample. The speech model is produced without using an external mechanism to monitor the accuracy with which the contents were identified. (Col. 1, line 65 - Col. 2, line 11) As noted in the Office Action, each model of a word may be represented by a set of phonemes that represent the phonetic spelling of a word. Furthermore, each phoneme may be represented by three sets of model parameters that correspond to the three nodes of the phoneme. (Col. 6, lines 26-29) This is not, however, having multiple levels of phonetic detail in accordance with the present invention.

A 35 U.S.C. 103(a) rejection requires that the combined cited references provide both the motivation to combine the references and an expectation of success. There is, however, absolutely no teaching or suggestion in Newman that would lead one of ordinary skill in the art to modify Goldenthal to arrive at the present invention. Moreover, actually combining the teachings of Goldenthal and Newman would not result in the in the present invention which requires specifically "providing a model

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corresponding to a target speaker, the model being resolved into at least one frame and capable of having **a plurality of levels of phonetic detail of varying resolution for each frame**" and "**determining, for each frame and each level of phonetic detail of the target speaker model**, a likelihood value; and resolving the at least one likelihood value to obtain a likelihood score." (Claim 1; emphasis added) Similar language appears in the other independent claims. This hierarchical approach in which there are a plurality of levels of phonetic detail with varying resolution, determining a likelihood value for each level, and then using the likelihood values to determine a likelihood score is simply not taught or suggested by either Goldenthal or Newman.

Applicants acknowledge that Claims 4-5, 13, 17-18 and 26 were indicated by the Examiner as being allowable if rewritten in independent form. Applicants reserve the right to file new claims of such scope at a later date that would still, at that point, presumably be allowable.

In view of the foregoing, it is respectfully submitted that Claims 1, 14 and 27 fully distinguish over the applied art and is thus are in condition for allowance. By virtue of dependence from what are believed to be allowable independent Claims 1 and 14, it is respectfully submitted that Claims 2-13 and 15-26 are also presently allowable.

In summary, it is respectfully submitted that the instant application, including Claims 1-27, is presently in condition for allowance. Notice to the effect is hereby earnestly solicited. In the unlikely event, however, it appears the claims will not be

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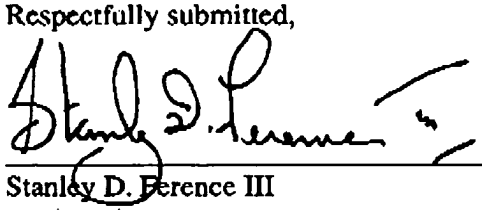
allowed, the Office is invited to call the undersigned to discuss the claims prior to the issuance of a further Office Action.

Respectfully submitted,



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